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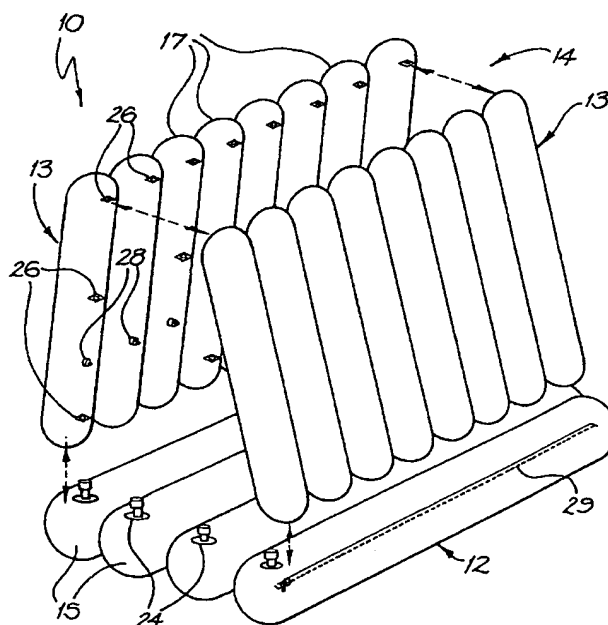
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(54) Title: INFLATABLE APPARATUS FOR DISPLAYING VISUAL IMAGES



(57) Abstract: Apparatus for displaying a visual image includes a device (10) having an inflatable main body (14) and a base portion (12). The main body (14) is formed from tubular members (17) which define a predetermined shape when inflated, providing at least one display face for displaying a visual image. The base portion (12) stabilises the device (10).

INFLATABLE APPARATUS FOR DISPLAYING VISUAL IMAGES

Technical Field

The present invention relates to apparatus for displaying visual images and more particularly, to inflatable devices for displaying visual images and information in general, such as advertising, film projection, warnings, etc.

Background of the Invention

Apparatus for displaying visual images such as billboards, screens and signboards in general have many various forms well-known globally and have been used to display information of all kinds. However, in general these apparatus are heavy, often permanent structures, which are difficult to transport and assemble. Screens and signage that are designed to be portable are typically restricted in size, awkward to transport, difficult to move once assembled or unable to be assembled in confined areas. Advertising billboards and signage used at motor vehicle race tracks are typically rigid structures which can potentially cause major damage and injury in the event of vehicle impact.

Inflatable apparatus in general are typically constructed of heavy materials such as canvas and are not able to be moved once inflated. These devices must be continually inflated using constant airflow to maintain their stature and require heavy or complicated means of stabilisation. Such devices do not provide a definite shape or configuration that is resilient and able to maintain a desired structure. Therefore, such devices are not appropriate for providing effective display surfaces and the potential applications of such devices are substantially limited.

Object of the Invention

It is the object of the present invention to substantially overcome or at least ameliorate one or more of the disadvantages of the prior art.

Summary of the Invention

Accordingly, the present invention provides apparatus for displaying a visual image, said apparatus including a device having:

- an inflatable main body configured to provide at least one display face, when said main body is inflated, for displaying said visual image; and
- a base portion for stabilising said device.

The main body is formed from a plurality of inflatable tubular members such that, when inflated and arranged on said base portion, said members define a predetermined shape.

Preferably, said base portion is formed from one or more sealable chambers.
5 Preferably, said sealable chambers comprise one or more of said tubular members. Preferably, a number of said tubular members are provided in the form of one or more integrally formed sheets of said tubular members. Any of said tubular members may be in direct fluid communication with others thereof or may be individually sealable. Preferably, said sheets of tubular members are formed from layers of a plastic material
10 seam welded together to form parallel rows of said tubular members. Preferably, said base portion is adapted to be at least partially filled with water or particulate matter for stabilising said device.

In a preferred embodiment, said tubular members include exterior members, which define the dimensions of said predetermined shape, and at least one interior
15 member which braces and supports said exterior members.

In another embodiment, said base portion is provided by at least one rigid base plate for stabilising said device. Preferably, said at least one base plate comprises a plurality of rigid base plates in hinged connection, to allow said device to be folded between said plates, when said main body is deflated.

20 In a preferred embodiment, said device comprises a plurality of said sheets either laced or stitched together, joined by cable ties or joined by zip mechanisms.

Preferably, said predetermined shape is a polygonal prism having a longitudinal axis. In one embodiment, said interior members are arranged parallel to said axis and extend throughout the length of said device. Alternatively, said interior members are
25 arranged perpendicular to said axis. Preferably, planar reinforcing structures, comprising one or more of said interior tubular members, are arranged perpendicular to said axis at various intervals along the length of said device. Preferably, said reinforcing structures comprise said sheets of tubular members.

In a preferred embodiment, at least one of said tubular members is arranged in
30 fluid communication with at least one other of said tubular members.

In a preferred embodiment, said apparatus includes an illumination source for illuminating said at least one display face. In a preferred embodiment, said device is provided with an internal cavity which may accommodate said illumination source.

In a preferred embodiment, said device is inflated using air, or alternatively, helium gas. Preferably, said base portion is at least partially filled with water, or alternatively, sand.

In a preferred embodiment, said apparatus further comprises a cover, providing
5 said visual image, which at least partially covers said main body portion. Said cover may be removable or permanent.

Preferably, said device is configured such that at least one said display face is inclined with respect to said base portion at an angle of at least 45°, when said main body is inflated.

10 In a preferred embodiment, said device is configured to generally adopt the shape of a trapezoidal prism, when said main body is inflated. In another preferred embodiment, said device is configured to generally adopt the shape of a triangular prism, when said main body is inflated. In another preferred embodiment said device is configured to generally adopt the shape of a rectangular prism, when said main body is
15 inflated.

In particular applications, said apparatus may include a source of compressed gas adapted for fluid communication with said main body. In such an application, said apparatus may also include means for regulating said source of gas. Said source of compressed gas and said regulator may be located remote from said device and
20 communicated with said main body via a fluid line.

In a preferred embodiment, said apparatus is entrenched in the ground such that only said main body is located above the surface of the ground.

In particular applications, said apparatus may include guy ropes to secure said device.

25 In a preferred embodiment, said at least one display face is adapted to display visual images projected thereon, when said main body is inflated.

In a preferred embodiment, said apparatus is located at a motor vehicle race track. In another embodiment, said display face has directions and/or warnings displayed thereon. In another embodiment, said display face has a visual image in the form of
30 advertising displayed thereon.

Brief Description of the Drawings

Preferred forms of the present invention will now be described by way of example with reference to the accompanying drawings wherein:

Figures 1A and 1B are a cross sectional view and a side view respectively of an apparatus for displaying visual images.

Figures 2A and 2B are a cross sectional view and a side view respectively of a further apparatus for displaying visual images.

5 Figures 3A and 3B are a cross sectional view, showing interior bracing members, and a side view respectively of a further apparatus.

Figures 4A and 4B are a cross sectional view, showing interior bracing members, and a side view respectively of a still further apparatus.

10 Figure 5 is a cross sectional view of an alternative arrangement of the bracing members and the base portion members of the apparatus.

Figure 6 is a side view of an alternative apparatus for displaying visual images.

Figures 7A and 7B are a cross sectional view, showing interior bracing members, and a side view respectively of a further apparatus.

15 Figures 8A and 8B are a cross sectional view, showing interior bracing members, and a side view respectively of a yet further apparatus.

Figure 9 is a perspective view of one embodiment of the apparatus with a cover.

Figure 10 is a perspective view of an apparatus for displaying visual images.

Figure 11 is a sectional view along line A-A of Figure 10.

Figure 12 is a sectional view along line B-B of Figure 10.

20 Figure 13 is a sectional view along line A-A of Figure 10 depicting an alternate configuration to that of Figure 11.

Figure 14 is a sectional view along line B-B of Figure 10 depicting the configuration of Figure 13.

25 Figures 15 and 16 are perspective views of further examples of apparatus for displaying visual images.

Figure 17 is an exploded perspective view of currently preferred apparatus for displaying visual images.

Figure 18 is an end view of the apparatus of Figure 17 showing additional inflatable members.

30 **Detailed Description of the Preferred Embodiments**

Referring to Figures 1A, 1B, 2A and 2B, an apparatus for displaying visual images includes an inflatable device 10 having an inflatable main body 14 configured to provide at least one display face 16 for displaying visual images when the main body 14 is inflated. The device further comprises a base portion 12, which is adapted to stabilise

the device 10. The device 10 comprises a plurality of inflatable tubular members 17, which form the main body 14 and the base portion 12 and which are arranged and fixed together such that, when the tubular members 17 are inflated, the device 10 adopts a predetermined shape providing the at least one display face 16. The predetermined shape is most preferably a triangular prism or a rectangular prism, having a longitudinal axis. The tubular members 17 of the base portion 12 can be filled with water or sand, in order to stabilise the device 10. The tubular members 17 comprise exterior members 18, which define the dimensions of the predetermined shape, and interior members 19, which brace and support the exterior members 18. As depicted in Figs 1A and 2A, the exterior members 18 and the interior members 19 may be arranged parallel to the longitudinal axis of the prism and may completely fill the interior of the device 10.

The device may comprise a plurality of modular elements joined by cable ties, zip mechanisms, hook and loop type fasteners, stitching or seam welding. The modular elements may be formed in various shapes and sizes to provide various shapes of the device 10. However, the modular elements preferably comprise sheets of integrally formed tubular members 17. Typically, the sheets of tubular members 17 are formed from layers of a plastic material seam welded together to form parallel rows of tubular members 17, similar to inflatable mattresses.

Referring to Figure 3A, the interior members 19 may be arranged perpendicular to the longitudinal axis of the prism. In this arrangement, planar reinforcing structures are provided by sheets of the interior tubular members 19, which lie in planes perpendicular to the prism axis. These sheets are preferably spaced at various intervals along the length of the device 10. As depicted in Figure 5, the tubular members 17 of the base portion 12 may comprise both interior 19 and exterior 18 members.

As depicted in Figures 4A and 4B, a number of the exterior members 18 may be arranged perpendicular to the prism axis, while others are arranged parallel to the axis. Various combinations are envisaged including the possibility of tubular members being arranged in any orientation.

As depicted in Figure 8B, some of the tubular members 17 may be arranged in a honeycomb-like structure.

Each of the tubular members 17 may be integrally formed and/or in fluid communication with one or more other tubular members 17. The device 10 may have a single inflation point, which would simplify the inflation of the device 10, or several inflation points so that, in the event of a puncture, the device 10 would not completely deflate.

Air is the preferred gas for inflating the main body 14 as it is cheap and readily available. However, helium having a lower relative density and being inert may be preferred in certain applications, although it is more expensive and difficult to contain. Other gases may also be used to suit different applications. The pressure to which the tubular members 17 are typically inflated is approximately 5 to 6 psi (30 to 45 kPa).

The display faces 16 may be configured in various ways to display the visual images thereon. The faces 16 of the device 10 may have information and/or images printed directly thereon or printed on separate material, which may be removably attached by attachment means, such as a hook and loop type tape fastener, provided on the device 10. As depicted in Figure 9, the device 10 may be provided with a removable cover 13 having images thereon, such that the images may be altered merely by replacing the cover 13. Alternatively, the faces 16 may be adapted to display visual images projected thereon or adapted to display images when illuminated by a light source, which may be located internally or externally of the device 10. If an illumination source is to be located internally of the device 10, the main body 14 would typically be made of a transparent material.

The above embodiments provide a light-weight rigid structure, which is easily erected and transportable. These embodiments provide a display face which will not bulge or sag, which increases the effectiveness of the visual image displayed. The stabilising base portion allows the device to stand independently of any securing mechanisms, such as guy ropes, in normal use.

Referring to Figures 10 and 11, an apparatus for displaying visual images includes a device 10 having a base portion 12 and an inflatable main body 14 configured to provide at least one substantially planar and generally upstanding face 16 for receiving the visual images, when the main body 14 is inflated. The base portion 12 comprises at least one sealable chamber 20 as a means for stabilising the device 10. The chamber 20 can be filled with water or a particulate material such as sand. The device 10 is configured to generally adopt the shape of a trapezoidal or triangular prism, when said main body 14 is inflated. The device 10 may also be configured to adopt other shapes such as a rectangular prism or pyramid. The main body 14 will typically be formed of tubular members as per the device of Figures 1 to 9.

In most applications, it is envisaged that the device 10, once inflated, would stand alone. However, in certain situations such as environments involving large temperature or pressure changes, the internal pressure may need to be regulated. In such applications, the apparatus may further include a source of compressed gas 30, a gas

regulator 32 and a fluid line 34, in fluid communication therewith. The fluid line 34 is sealingly engageable with the main body 14 to provide communication between the gas source 30 and the main body 14 for inflation of the main body 14. While in most conditions it is envisaged that the base portion 12 will provide sufficient stability, in high
5 wind conditions, it may be necessary to provide additional stabilising means. Accordingly, the apparatus may further include guy ropes 40 to further stabilise the device 10.

The regulator 32 can be used to adjust the pressure of the gas in the main body 14, as conditions such as temperature change over time, to ensure that the main body 14
10 remains fully inflated. Alternatively, the fluid line 34 may be detached and the main body 14 sealed after inflation.

As shown in Figure 12, the base portion 12 may include a number of separate sealable chambers 20a, 20b, 20c, which may be filled with liquid or a particulate matter such as sand. As such, the base portion 12 may be folded between each chamber 20a,
15 20b, 20c, when the main body 14 is deflated. This facilitates transport and storage of the device 10 as it can be easily folded into a compact configuration even when the chambers are at least partially filled with water or sand. In such applications, the base portion 12 may be constructed from a heavy canvas or plastic to increase stability.

In another apparatus depicted in Figure 13 and 14, the base portion 12 includes at
20 least one rigid base plate 22 as a means for stabilising the device 10. The base plate 22 may be divided into a number of smaller individual plates 22a, 22b, 22c in hinged connection, such that the base portion 12 may be folded up along with the main body 14, when the main body 14 is deflated, to facilitate transport and storage of the device 10.

For applications in which there is a possibility or likelihood of something
25 impacting the device, the apparatus, including the compressed gas source 30 and regulator 32, may be entrenched in the ground such that only the main body 14 of the device 10 is located above the surface of the ground. Such applications would typically include advertising at motor vehicle and motorcycle racing venues and also at equestrian events. The compressed gas source 30 and regulator 32 may be located away from the device 10
30 and gas supplied to the main body 14 by the fluid line 34. In the event of a collision with the apparatus, only the inflatable main body 14 would be impacted, reducing the risk of serious damage or injury.

In other applications, the apparatus may be used for displaying warnings or directions of emergency services, such as police directions at an accident scene. The
35 apparatus may also be used to provide a barricade which may include a number of the

devices placed end to end. In such applications, the compact apparatus may be stored in a vehicle's luggage compartment and easily arranged and inflated when necessary. The apparatus may also be used to provide divider walls for temporary establishments such as trade shows and exhibitions. In such applications, the device may be constructed of a light weight material and filled with air so that the device is self supporting. The device may be located by means such as clips on the floor or by being tied to the floor, which are simpler and lighter than restraints used for conventional dividers.

In its simplest form, the device 10 may consist of a light, flexible and air tight material such as plastic, preferably polyvinylchlorate (PVC). However, as the applications and environment conditions in which the apparatus may be used can vary substantially, the materials of which the device 10 is constructed may vary accordingly. Heavier more durable material may be used for larger applications and for extreme weather conditions such as lined canvas or other fabric. As the size of the device 10 and type of material vary, the pressure required within the inflated main body 14 will also vary accordingly, with higher pressures required for larger, heavier constructions.

The apparatus may also include means for recompressing the gas when deflating the device 10, so that the same gas can be reused in a subsequent application.

Referring to Figure 15, an alternative version of the device 10, comprising a plurality of inflatable tubular members 17, may simply form a basic framework over which a cover (not shown) is placed to display the visual image. Alternatively, as depicted in Figure 16, panels of fabric 42 may be secured to the framework by lacing or other means, to display the visual image. In this embodiment, the fabric panels 42 may act as stress members and assist in stiffening the device 10.

A particularly preferred form of the device 10 is depicted in Figures 17 and 18. The main body portion 14 includes two lateral sheets 13 of integrally formed tubular members 17. The base portion 12 includes a single sheet of integrally formed tubular members 15. Due to the buoyancy of the device 10 of this and other embodiments, the apparatus may be adapted to locate the device on water, by means of attachment to a buoy or other means of anchoring.

The tubular members 17 of the main body portion 14 are provided with inflation points 28 and attachment points 26. Each of the tubular members 17 is separately inflatable via the inflation points 28. Attachment points 26 are adapted to receive cable ties or lacing to attach the two lateral sheets 13 of the main body portion 14. The tubular members 15 of the base portion 12 are provided with fluid supply points 24.

When assembling this embodiment of the device 10, each of the tubular members 15 of the base portion 12 is partially filled with water via an externally threaded port at each of said fluid supply points 24. Screw-threaded caps, each housing a valve, are threadably secured over each port. Each of the tubular members 15 can then be
5 further inflated with pressurised air via the valves to ensure rigidity of the base portion 12. The material of the tubular members 15 of the base portion 12 will typically be formed from a suitably heavy duty material to protect against rough handling of the device 10 being dragged along the ground, or alternatively the base portion 12 might be encased in a separate cover of protective heavy duty material to avoid handling damage.

10 Each of the tubular members 17 of the lateral sheets 13 are inflated with pressurised air via valves provided at the inflation points 28. Once inflated, the lateral sheets 13 are laced together with cable ties at attachment points 26 along a top side of each lateral sheet 13. The attached lateral sheets 13 are arranged to rest on the base portion 12 as shown in Figure 17 to form a generally triangular prism. It is not necessary
15 to directly secure the main body portion 14 to the base portion 12, although if desired, the main body 14 and base portion 12 may be secured to one another at additional attachment points.

The base portion 12 is also provided with zip mechanisms 29 provided along opposite edges of the base portion 12, to attach a cover 54 providing a visual image. The
20 cover is placed over the main body portion 14 and attached via the zip mechanisms 29 to the base portion 12. The cover 54, when attached by the zip mechanisms 29, acts to maintain the main body portion 14 relative to the base portion 12.

The preferred embodiment of the device 10 further includes an elongate inflatable bladder 50. The bladder 50 is placed between the base portion 12 and the two
25 lateral sheets 13 of the main body portion 14 and extends the length of the device 10. The bladder 50 is inflated after the cover 54 has been attached and forces the lateral sheets 13 outwards, stretching the cover 54 so as to provide a taut, flat surface for displaying the visual image. The device 10 may further include an elongate inflatable auxiliary member 52. The auxiliary member 52 is arranged above the two lateral sheets 13 of the main
30 body portion 14 and extends the length of the device 10. The auxiliary member 52 is inflated after the cover 54 has been attached and acts to further stretch the cover 54.

CLAIMS:

1. Apparatus for displaying a visual image, said apparatus including a device having:
 - an inflatable main body configured to provide at least one display face, when said main body is inflated, for displaying said visual image; and
 - a base portion for stabilising said device,wherein said main body is formed from a plurality of inflatable tubular members such that, when inflated and arranged on said base portion, said members define a predetermined shape.
2. The apparatus of claim 1, wherein a number of said tubular members are provided in the form of integrally formed sheets of said tubular members.
3. The apparatus of claim 2, wherein said sheets of tubular members are formed from layers of a plastic material seam welded together to form parallel rows of said tubular members.
4. The apparatus of claim 1, wherein said tubular members are individually sealable.
5. The apparatus of claim 1, wherein at least one of said tubular members is arranged in fluid communication with at least one other of said tubular members.
6. The apparatus of claim 1, wherein said tubular members include exterior members, which define the dimensions of said predetermined shape, and at least one interior member which braces and supports said exterior members.
7. The apparatus of claim 6, wherein said predetermined shape is a polygonal prism having a longitudinal axis.
8. The apparatus of claim 7, wherein said at least one interior member is/are arranged parallel to said axis and extend(s) throughout the length of said device.
9. The apparatus of claim 7, wherein said at least one interior member is/are arranged perpendicular to said axis.
10. The apparatus of claim 7, wherein planar reinforcing structures, each comprising one or more of said interior tubular members, are arranged perpendicular to said axis at intervals along the length of said device.
11. The apparatus of claim 10, wherein said reinforcing structures are in the form of integrally formed sheets of said tubular members.
12. The apparatus of claim 1, wherein said device is configured such that at least one said display face is inclined with respect to said base portion at an angle of at least 45°, when said main body is inflated.

13. The apparatus of claim 1, wherein said base portion is formed from one or more sealable chambers adapted to be at least partially filled with water or particulate matter for stabilising said device.

14. The apparatus of claim 13, wherein said sealable chambers comprise
5 one or more tubular members.

15. The apparatus of claim 14, wherein said main body tubular members and said base portion tubular members are in the form of integrally formed sheets of said tubular members joined together.

16. The apparatus of claim 1, wherein said base portion is provided by at
10 least one rigid base plate for stabilising said device.

17. The apparatus of claim 16, wherein said at least one base plate comprises a plurality of rigid base plates in hinged connection, to allow said device to be folded between said plates, when said main body is deflated.

18. The apparatus of claim 1, further including an illumination source for
15 illuminating said at least one display face.

19. The apparatus of claim 18, wherein said device is provided with an internal cavity accommodating said illumination source.

20. The apparatus of claim 1, further including a cover, providing said visual image, which at least partially covers said main body.

21. The apparatus of claim 20, further including an auxiliary inflatable
20 member located between said main body and said cover for tensioning said cover.

22. The apparatus of claim 1, further including a source of compressed gas adapted for fluid communication with said main body.

23. The apparatus of claim 22, further including means for regulating said
25 source of gas.

24. The apparatus of claim 23, wherein said source of compressed gas and said regulator are located remote from said device and communicated with said main body via a fluid line.

25. The apparatus of claim 1, wherein said apparatus is entrenched in the
30 ground such that only said main body is located above the surface of the ground.

26. The apparatus of claim 1, further including guy ropes to secure said device.

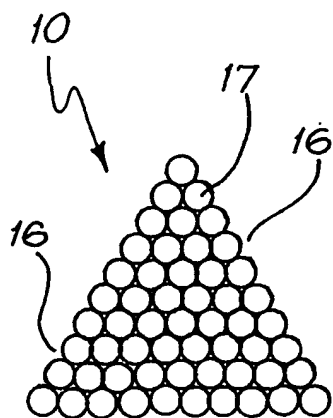


FIG. 1A

1/7

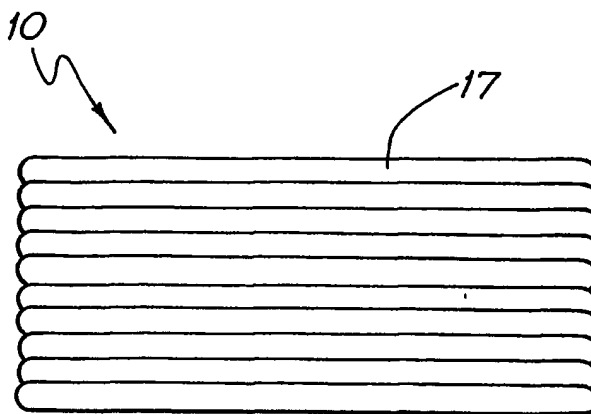


FIG. 1B

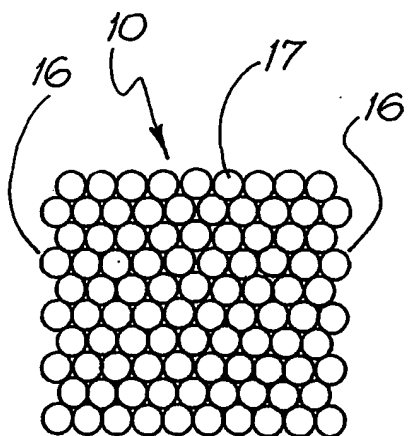


FIG. 2A

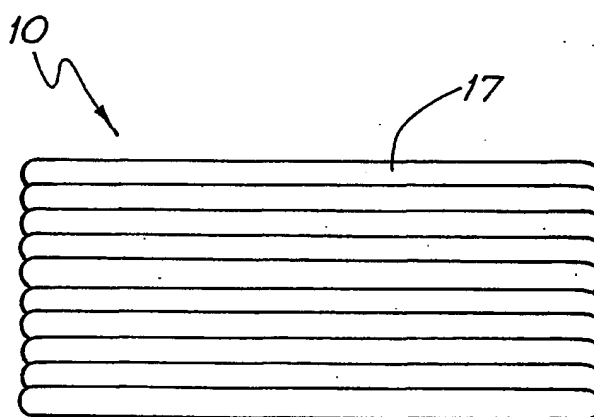


FIG. 2B

2/7

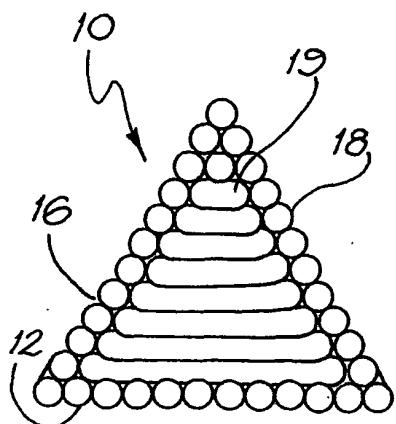


FIG. 3A

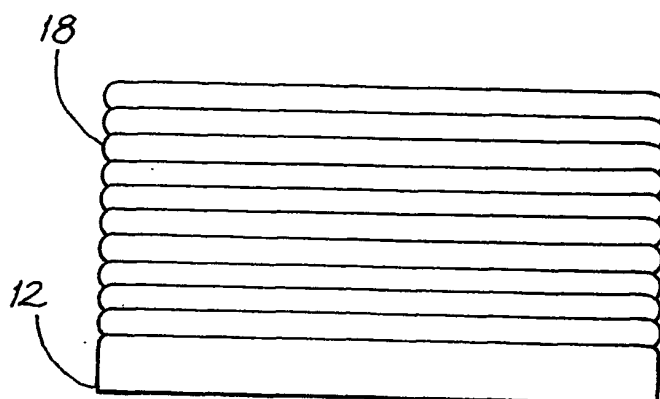


FIG. 3B

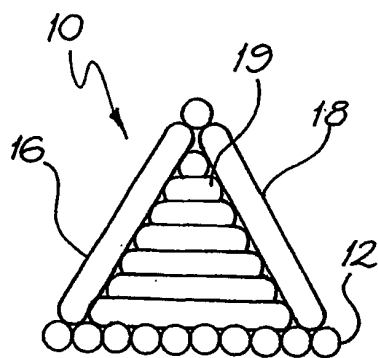


FIG. 4A

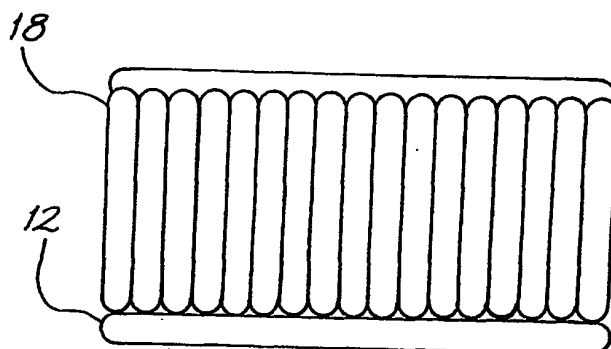


FIG. 4B

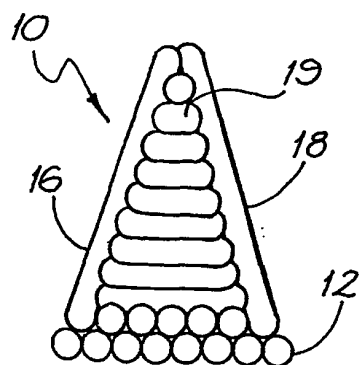


FIG. 5

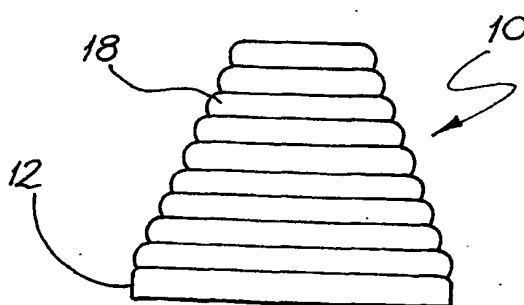


FIG. 6

3/7

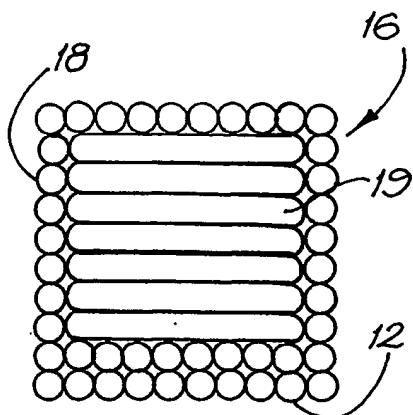


FIG. 7A

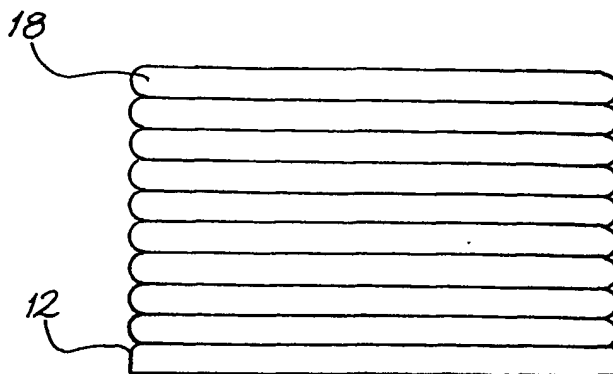


FIG. 7B

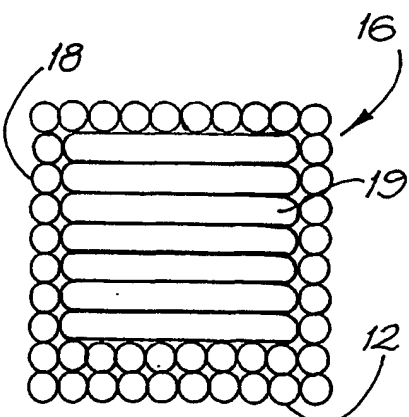


FIG. 8A

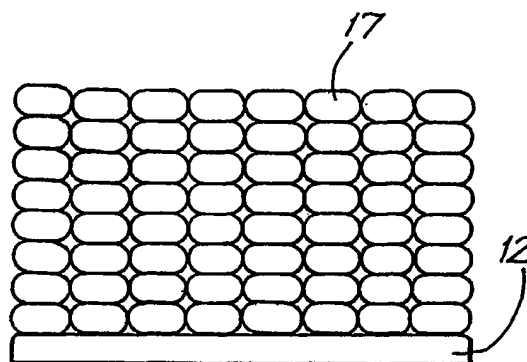


FIG. 8B

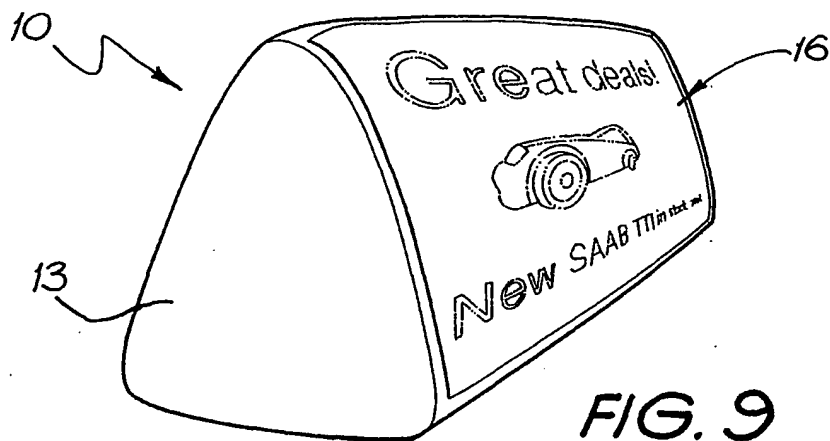


FIG. 9

4/7

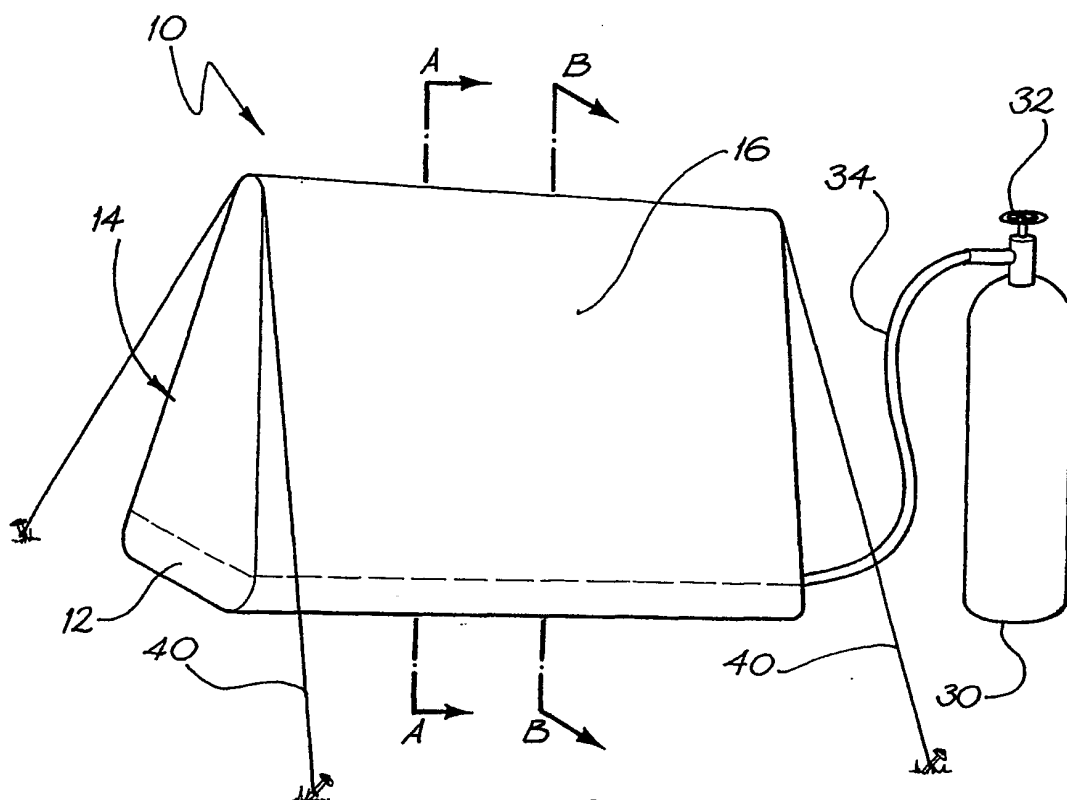


FIG. 10

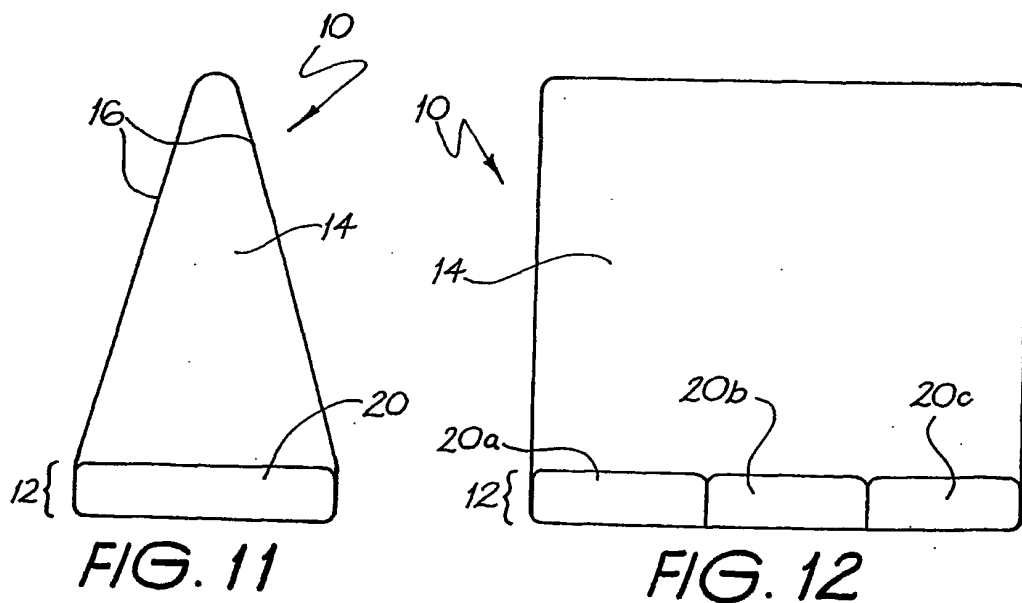


FIG. 11

FIG. 12

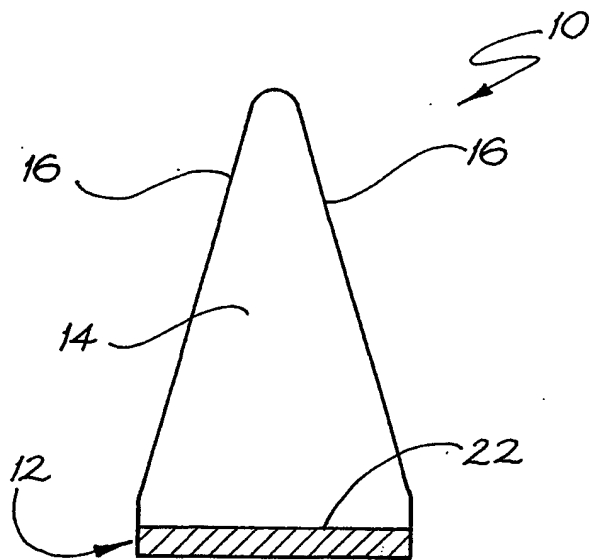


FIG. 13

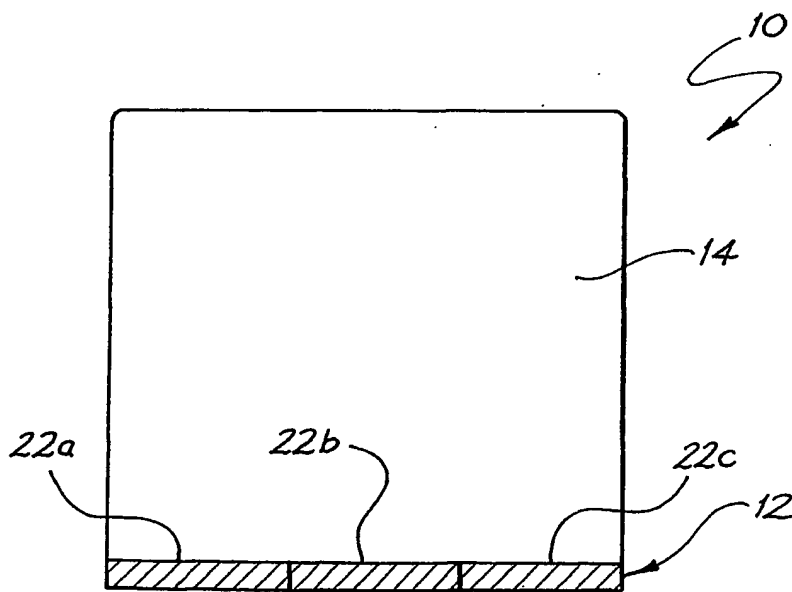


FIG. 14

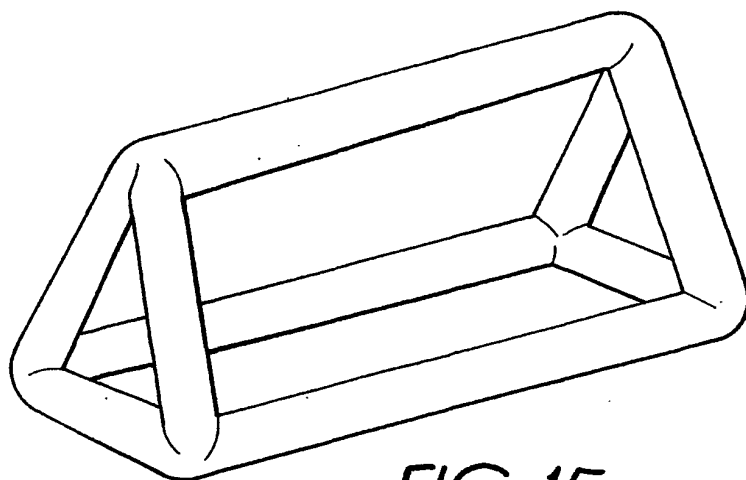


FIG. 15

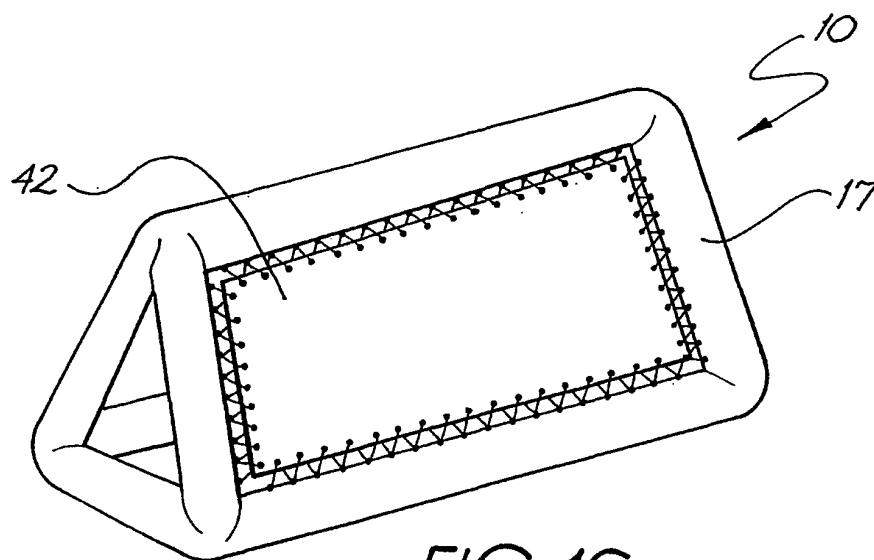
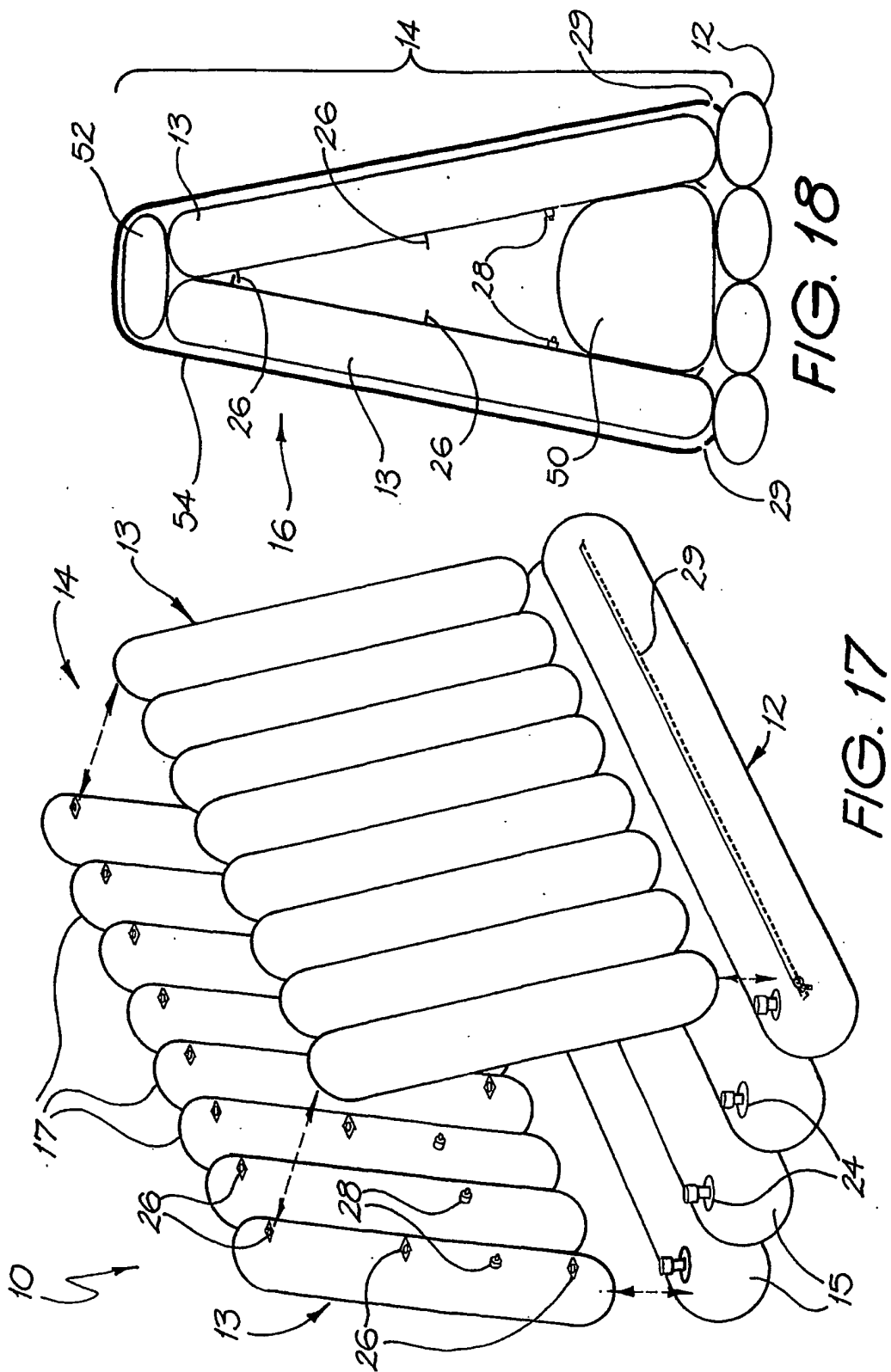


FIG. 16



INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU01/01565**A. CLASSIFICATION OF SUBJECT MATTER**Int. Cl. ⁷: G09F 15/00, 21/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
IPC G09FDocumentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU:IPC AS ABOVEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT, USPTO**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4369591A, VICINO, 25 January 1983	1-26
A	US 4776121A, VICINO, 11 October 1988	
A	EP 1006504A, SEALROSE GROUP LIMITED, 7 June 2000	

☐ Further documents are listed in the continuation of Box C
 ☒ See patent family annex

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

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"&" document member of the same patent family

Date of the actual completion of the international search

18 December 2001

Date of mailing of the international search report

- 8 JAN 2002

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU01/01565

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
US	4369591	CA	1205999		
US	4776121	AU	17122/88	CA	1263232 WO 8808601
EP	1006504	NONE			
END OF ANNEX					

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